TOXICOLOGY

Deadly Sea Beasts or Lifesavers?

Australia's Great Barrier Reef, famous as a tourist lure, may hold the key to some of medicine's mysteries.

Ironically, major hopes are pinned on the most deadly of the reef's inhabitants —among them the sea wasp, the conefish and the Crown-of-Thorns starfish.

Among them they have killed more than 30 people in Queensland, Australia's most northerly state. Now, they're being used to save lives.

The man behind this unique project is Dr. Robert Endean, the University of Queensland reader in zoology and one of Australia's top experts in rare poisons.

Dr. Endean recently revealed some of the findings of his six-man research team. One of the most important successes is the isolation of remarkable toxins from two varieties of cone shell.

From one variety is extracted a toxin which acts as a muscle relaxant. It affects only the muscles attached to the skeleton and does not exhibit any of the side effects or handling difficulties associated with curare-type drugs which are now used as muscle relaxants.

Unique Muscle Drug

From another variety the team has extracted a toxin which causes a sustained contraction of muscle.

"I know of no other substance in the world which can achieve this effect," Dr. Endean said.

"With both, the effect ceases as soon as the toxin is removed. I feel sure that these toxins can be used to treat muscular impairment which results from some diseases.

"The second conefish toxin also could prove to be a heart stimulant. We have already tried it on the heart muscles of a toad with success."

Another promising reef creature is the Crown-of-Thorns starfish from which the team has isolated a toxin that may be used to treat cancer.

Dr. Endean said that the toxin seemed to be identical to one isolated from a beche-de-mere or sea slug which inhibited tumors in mice.

One of the most remarkable toxins isolated so far is from the killer sea wasp, a long-tentacled jellyfish that has claimed many lives in Queensland. Its victims die in agony within seconds.

Dr. Endean hopes to reveal details of the possible clinical applications of the toxin within the next two months.

"We believe they could be quite spectacular—to medical science and to the general public," he said. "But until we have checked our work more closely we are not prepared to reveal our preliminary results."

Isolation of the sea wasp toxin—achieved only this year—was, in itself, a major breakthrough.

Originally, the work was undertaken to find an antidote—and the possible new clinical applications arose from this.

The toxin of the sea wasp is so deadly that even when diluted 10,000 times in water, it causes death in laboratory animals before the hypodermic needle can be removed.

Nightmares, Brain Surgery

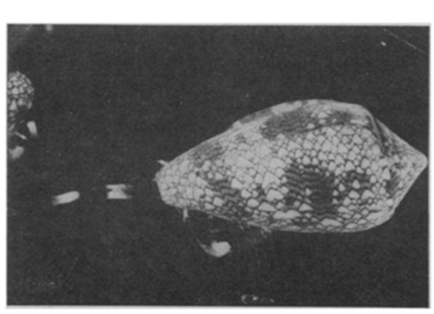
A toxin isolated from the goat fish—common in north Queensland waters—has been shown to cause hallucinations and nightmares. "The study of this could well throw light on the cause of hallucinations," Dr. Endean said.

Another toxin isolated from the tissues of the Queensland toadfish already is being used in the United States in brain surgery.

And venom from the stonefish—the world's deadliest fish—has been used to lower blood pressure.

Dr. Endean said that the Great Barrier Reef was proving to be a vast underwater storehouse which, in the future, might supply new therapeutic drugs, antibiotics and possible anti-cancer agents.

"And Queensland, because of the vast amount of raw material available, has the opportunity to become the world center of this remarkable field."



Smithsonian

Cone shell—killer and cure

PUBLIC POLICY

Budget Slice Hits Science

As Washington agencies handcraft their 1968 budgets, there are strong signs that government support of basic research will slacken in that period.

President Lyndon B. Johnson, who has already told medical scientists that he'd rather see application than pure research, announced Nov. 29 cuts in the current budget totaling $5.3 billion, some of which will fall on the space program and possibly the National Institutes of Health.

Emphasizing that the move "wouldn't cause a change in the target date of the moon schedule," President Johnson announced a cut of $60 million for the space agency. National Aeronautics and Space Administration officials said none of the major programs, manned or unmanned, will be slowed. Most of the money will be found by deferring to another year projects already planned and trimming undirected research.

The NASA Sustaining University Program, which funds facilities and study in space-related basic fields, will feel the pinch. Already NASA has a job freeze.

From the Department of Health, Education and Welfare comes word that its $530-million share of the cut will also be made up in part of deferred building projects. "Each project will be looked at as it comes up and a decision made at that time," an official said. This could put off construction of some university health research facilities, particularly the $35-million worth that Congress, ever helpful to NIH, added to the current budget in disregard of White House recommendations.

In the face of these actions budget writers now working are expected to pare as much as they can from next year's requests. Some large basic science projects appear on shaky ground.

One is the 200 billion electron volt accelerator, worth some $375 million in total. Dr. Glenn T. Seaborg, Chairman of the Atomic Energy Commission has said he is confident of a "small amount" of planning money for next year, but it might be deferred.

Another likely victim is the up-again-down-again Mohole. After Congress refused it funds last year, National Science Foundation officials were expected to go back up the Hill this year trying again. Now there is a good chance the Mohole can't even be drilled through the Budget Bureau, and Congress may not have another chance to plug it up.